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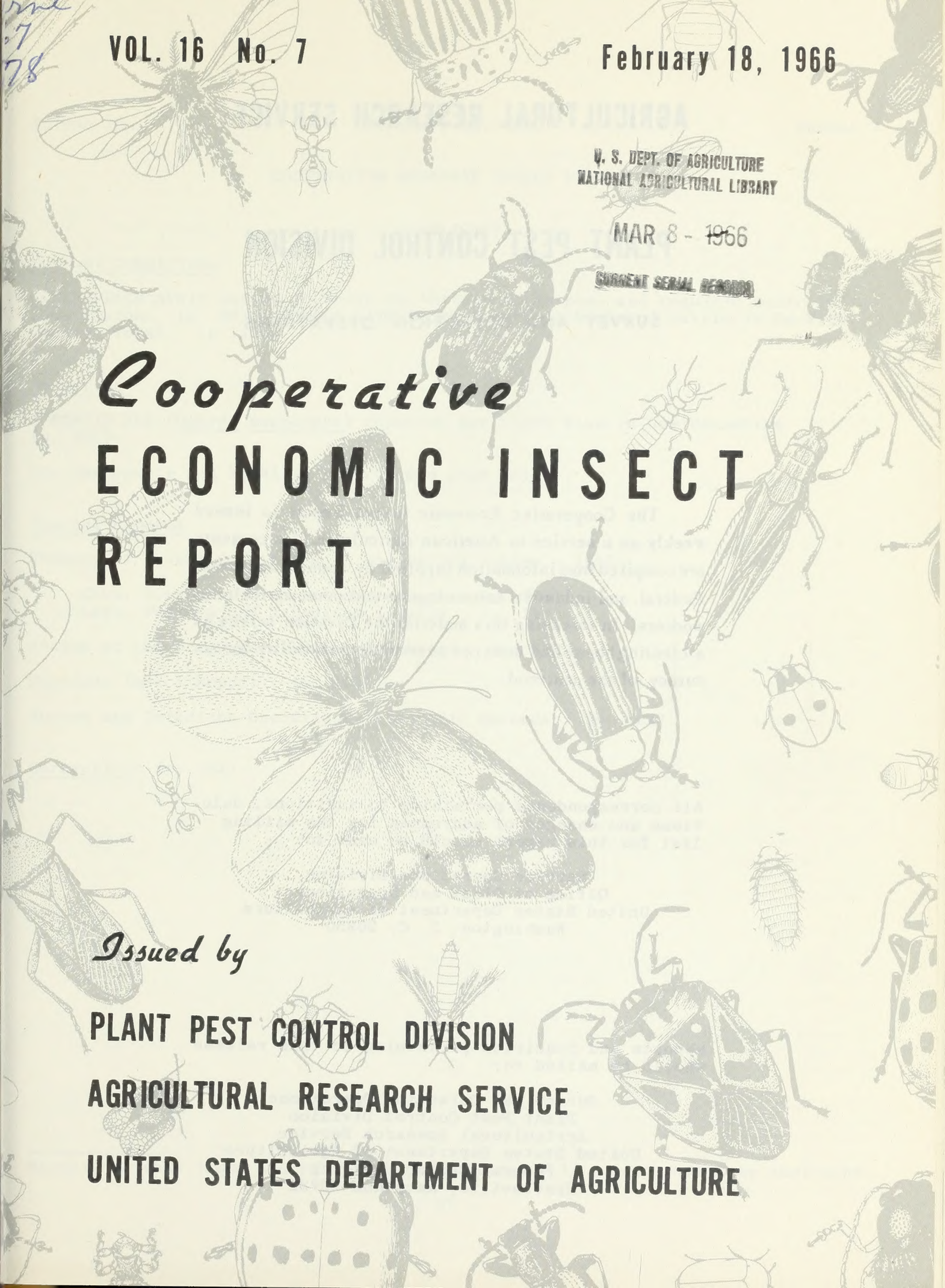

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 16 February 18, 1966 Number 7

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

Current Conditions

GREEN PEACH APHID medium to heavy on lettuce in Arizona and required controls in some fields. (p. 99). COMMON CATTLE GRUB heavy in backs of cattle in De Witt County, Texas. (p. 100).

Detection

A MUSCID FLY (*Ophyra aenescens*) reported for first time in New Hampshire. (p. 101).

For new county and locality records see page 101.

Special Reports

Summary of Insect Conditions in the United States - 1965

Corn, Sorghum and Sugarcane Insects. (p. 104).
Lawn, Pasture and Rangeland Insects. (p. 114).

Status of the Screw-worm in the Southwest. (p. 100).

Hawaiian Insect Report. (p. 103).

Survey and Detection Operations Scientific Records. (p. 102).

Corrections (p. 102).

Reports in this issue are for week ending February 11 unless otherwise indicated.

WEATHER BUREAU'S 30-DAY OUTLOOK

MID-FEBRUARY TO MID-MARCH 1966

The Weather Bureau's 30-day outlook for mid-February to mid-March calls for temperatures to average below seasonal normals west of the Appalachians with greatest departures in the central and southern Plains. Above normal averages should be confined to the South Atlantic Coastal States while near normal temperatures are anticipated elsewhere. Precipitation is expected to exceed normal east of the Continental Divide except for near normal amounts over western portions of the southern Plains as well as the upper Mississippi Valley and coastal regions of the North Atlantic Coastal States. West of the Divide precipitation is expected to range from above normal over the southern half to subnormal over the Northwest.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

WEATHER OF THE WEEK ENDING FEBRUARY 14

HIGHLIGHTS: (1) Cold spell ends Central and East; winter returns to West. (2) Tornadoes, thunderstorms, and heavy rains South and East.

TEMPERATURE: Southerly winds brought springtime temperatures to the middle of the Country during the early part of the week. For the first time in more than a month the mercury climbed above freezing in the northern Plains and Great Lakes region. The longest spell of subfreezing readings in Detroit since 1912 was broken. Warm temperatures gradually spread eastward to the Atlantic rapidly melting the snow cover and ending the long cold spell in the South and East. Northern Maine had above normal readings for the fourth consecutive week. As the East warmed, the compensatory nature of the upper air flow brought much below normal temperatures to the West.

PRECIPITATION: During the first half of the week the recent pattern of light precipitation through central portions of the Country was sharply broken by heavy shower activity. Warm, moist air flowing from the gulf caused heavy rains from Louisiana and vicinity to the Canadian border with weekly totals of 4 to 8 inches in much of the South. Strong winds over 50 m.p.h., and hail over an inch in diameter accompanied the thunderstorms in many localities. Southeastern Oklahoma experienced the wettest week in 15 months, and east and central Texas had heavy rains for the fourth consecutive week. Local flooding of streams was common throughout the Midwest.

A low pressure system developed in the gulf and moved along the Appalachians during the weekend. Heavy rains drenched the area that had been hit hard by recent snowstorms. Pennsylvania recorded the wettest week in more than 2 years. Moderate flooding was generally widespread; extreme flooding was common in western North Carolina and eastern Tennessee. Nearly two-thirds of the houses in Rosman, North Carolina, were flooded and some persons were evacuated. Highways in southeastern Kentucky were closed and bridges in Mississippi were washed out because of high water. Damage from wind and rain in Georgia was in excess of $100,000.

Dense fog was prevalent in the Midwest on February 7-8 and in the Middle Atlantic States on February 11-13 as warm air passed over the cold snow cover; visibilities near zero hampered highway driving and halted air traffic. Conditions improved when the snow melted. In contrast to the warmth and heavy rains that spread over

Weather continued on page 102.

CEREAL AND FORAGE INSECTS

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) - ARIZONA - Increased slightly in alfalfa in Maricopa County; unchanged in Yuma County. (Ariz. Coop. Sur.).

PEA APHID (Acyrthosiphon pisum) - ARKANSAS - Surveys negative in Miller County alfalfa. (Ark. Ins. Sur.). NEW MEXICO - Very light in alfalfa near Corrales, Sandoval County (Heninger, Kloepfer); also light in Chaves County alfalfa (Mathews).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARKANSAS - Surveys negative in Miller County. (Ark. Ins. Sur.).

THRIPS - NEW MEXICO - Very light to light in Chaves County alfalfa. (N. M. Coop. Rpt.).

A WEEVIL (Hypera brunneipennis) - ARIZONA - No adults found in Yuma County alfalfa; but larvae ranged 20-40 per 100 sweeps. Small numbers of adults in Chandler area. (Ariz. Coop. Sur.).

CLOVER MITE (Bryobia praetiosa) - ARIZONA - Medium to heavy in alfalfa fields on Yuma Mesa, Yuma County. (Ariz. Coop. Sur.).

GREENBUG (Schizaphis graminum) - ARKANSAS - Surveys negative in various eastern areas. Ranged 15-20 per row foot in field of oats in Johnson County, same as in this field in November 1965. (Ark. Ins. Sur.).

FRUIT INSECTS

CALIFORNIA RED SCALE (Aonidiella aurantii) - CALIFORNIA - Locally medium on citrus trees in Woodland, Yolo County; heavy on citrus in Arroyo Grande, San Luis Obispo County; medium on oranges in Knights Landing, Yolo County. (Cal. Coop. Rpt.).

OLEANDER SCALE (Aspidiotus hederae) - CALIFORNIA - Light on grapefruit in Roseville, Placer County. (Cal. Coop. Rpt.).

OLIVE SCALE (Parlatoria oleae) - CALIFORNIA - Heavy on almond nursery stock in Marysville, Butte County. (Cal. Coop. Rpt.).

FLORIDA WAX SCALE (Ceroplastes floridensis) - FLORIDA - Infesting leaves of 70 of 100 avocado trees in nursery at Deerfield Beach, Broward County. (Clinton, Jan. 27).

TRUCK CROP INSECTS

FALSE CELERY LEAF TIER (Udea profundalis) - CALIFORNIA - Larvae damaging radish plantings in Fresno, Fresno County. Radish apparently new host record for this species. (Cal. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Major pest on lettuce in Yuma County. Medium to heavy infestations require controls in many fields. (Ariz. Coop. Sur.).

TWO-SPOTTED SPIDER MITE (Tetranychus urticae) - FLORIDA - Adults infesting strawberry in Bradford County. (Huggins, Feb. 9).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SCALE INSECTS - FLORIDA - Ceroplastes ceriferus moderate on stems of 1,000 out of 5,000 podocarpus plants at Tampa, Hillsborough County, (Barber, Jan. 19); infesting 100 of 1,000 podocarpus in nursery at Goulds, Dade County, (Knowles, Jan. 21). Pseudaonidia duplex moderately damaged stems of 50 out of 100 pussy willow plants in Tampa nursery. This is new host record for Florida Department of Plant Industry. (Barber, Jan. 18). ALABAMA - Heavy, isolated infestations of Fiorinia theae continue to affect camellias and Burford holly in Henry and Lee Counties. Extreme low temperatures (zero to 10°) apparently not affecting survival. (McQueen). CALIFORNIA - Apsidiotus hederae locally heavy on rhododendrons in in Gridley, Butte County. Asterolecanium arabidis locally heavy on pittosporum in Sacramento, Sacramento County. (Cal. Coop. Rpt.).

WATERLILY APHID (Rhopalosiphum nymphaeae) - FLORIDA - Severely damaged stems and leaves of Dieffenbachia sp. in nursery at Winter Garden, Orange County. (Ware, Feb. 1).

INSECTS AFFECTING MAN AND ANIMALS

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

During the period February 6-12, no cases were reported in the United States. The Republic of Mexico reported 12 cases by State as follows: Territorio sur de Baja California 2, Sonora 4, Chihuahua 2, and Tamaulipas 4. Sterile screw-worm flies released: Texas 10,966,250, Mexico 53,980,000.

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
Table 1.	Comparison of specimens reported during corresponding week in 1964 and 1965 in Southwestern Eradication Area. (1966 area figures include cases reported from Arizona and/or California; 1965 figures reflect those from the 5-State area).					
1964	0	0	37	195	0.00	0.00
1965	0	4	28	348	0.00	1.14
1966	0	25	13	127	0.00	19.68
Table 2.	Comparison of specimens reported during corresponding week and in a corresponding area in 1965 in the United States-Mexico Barrier Zone.*					
1965	14	337	16	213	87.50	158.21
1966	12	327	11	109	109.09	300.00

Mexico Field Study - No report received for this period. (This was previously titled Feasibility Survey).

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* Barrier Zone - Area in which screw-worm eradication operations are being carried out in an effort to prevent establishment of self-sustaining screw-worm populations in the United States. (Anim. Health Div.).

COMMON CATTLE GRUB (Hypoderma lineatum) - TEXAS - Heavy in backs of cattle in De Witt County. (Newton).

MOSQUITOES - LOUISIANA - Larval collections by Jefferson Parish Department of Mosquito Control for period ending February 11 contained Aedes sollicitans, Aedes vexans, Anopheles quadrimaculatus, Culex restuans, Culex salinarius and Culiseta inornata. Light trap collections continued light; Culiseta inornata predominated. (Stokes).

A MUSCID FLY (Ophyra aenescens) - NEW HAMPSHIRE - Breeding in rotting eggs and manure in poultry house in South Wolfeboro, Carroll County, December 29, 1965. Adults entering egg room. Det. by H. C. Huckett. This is a new State record. (Sutherland).

BENEFICIAL INSECTS

A PUNCTURE-VINE SEED WEEVIL (Microlarinus lareynii) - CALIFORNIA - Adults collected from gin trash screenings in desert area and various other locations in State. These hibernating adults indicate species well established and widespread. (Cal. Coop. Rpt.).

LADY BEETLES - NEW MEXICO - Occasional adult noted in Chaves County alfalfa. (Mathews).

INSECT DETECTION

ARGUS TORTOISE BEETLE (Chelymorpha cassidea) - CALIFORNIA - Several specimens collected in Jeffrey pine plantation in Modoc National Forest near Adin in August 1963; determined in January 1966. No host is recorded. Previous records in State consist of single specimen taken at Cedar Pass, Modoc County, in 1959 and possible single specimen taken in this general area in 1954; 1954 specimen forwarded for verification. (Cal. Coop. Rpt.).

A MUSCID FLY (Ophyra aenescens) breeding in poultry house in Carroll County, New Hampshire, December 29, 1965. (see above).

AN ANT (Myrmecina americana) - FLORIDA - Collected in oak duff at Gainesville, Alachua County, October 31, 1965. (O'Berry). This is second Florida Department of Plant Industry record. (Fla. Coop. Sur.).

A DRYWOOD TERMITE (Incisitermes minor) - TEXAS - Collected from driftwood in Harris County. (Simon, Jan. 28). This is a new county record. (PPC).

A SNAIL (Rumina decollata) - CALIFORNIA - Locally medium in La Habra Heights, Los Angeles County. This is new county record, and second record for State. (Cal. Coop. Rpt.).

FEDERAL-STATE PLANT PROTECTION PROGRAMS

CITRUS WHITEFLY (Dialeurodes citri) - CALIFORNIA - Treatment and survey continued in Sacramento, Sacramento County, and Fresno, Fresno County, eradication projects. Survey in areas outside known infestations continued. In Sacramento, new light infestation found by grid inspection in Gardenland area; this area separated from Sacramento proper by American River. (Cal. Coop. Rpt.).

LIGHT TRAP COLLECTIONS

FLORIDA (Gainesville, 2/9) - Agrotis ipsilon 3, Pseudaletia unipuncta 2.

GEORGIA (Tifton, 2/2-9; temp. 24-74°F.; precip. zero; blacklight) - Heliothis zea 0, H. virescens 0, Manduca quinquemaculata 0, M. sexta 0.

SOUTH CAROLINA (Charleston, 1/31-2/6; temp. 21-58°F.; precip. 0.08 in.; blacklight) - Psuedaletia unipuncta 2, Spodoptera frugiperda 0, Prodenia ornithogalli 0, Agrotis ipsilon 2, Feltia subterranea 2, Peridroma saucia 0, Heliothis zea 0, H. virescens 0, Manduca sexta 0, M. quinquemaculata 0, Estigmene acrea 0, Trichoplusia ni 0.

CORRECTIONS

CEIR 16(5):68 - GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) - HAWAII - should read A WHITEFLY (Dialeurodes kirkaldyi) - HAWAII.

SURVEY AND DETECTION OPERATIONS SCIENTIFIC RECORDS

Records on domestic and foreign insects and related pests are maintained by Survey and Detection Operations in Hyattsville, Maryland. This collection, of over 600,000 entries and 50,000 species, is one of the largest of its kind in the world. The data on a number of species include distribution, host plants, economic importance, parasites and predators, and bionomics. For some species, only a limited amount of material is available.

The records were started in 1921 in the former Bureau of Entomology but data, as far back as 1758, have been included.

Cooperators are invited to make use of this information. Survey and Detection Operations will be glad to answer requests as manpower permits. As the data are filed alphabetically by genus and species, the use of scientific names, when making a request, will facilitate the preparation of answers.

Weather continued from page 98.

most of the Nation, the West and Dakotas experienced typically wintry weather. Heavy snow driven by strong northerly winds crossed the Dakotas and moderate snow fell throughout the Rockies. Also, normal light but frequent rain fell in the Pacific Northwest.

TORNADOES: Oklahoma reported one and Mississippi 4 twisters during the first half of the week in connection with the thunderstorms that graced the Midwest. On Sunday several tornadoes were observed in Georgia, North Carolina, and Virginia ahead of a cold front; one fatality occurred in Statesville, North Carolina. February is normally a month of maximum tornadic activity in the Southeast. (Summary supplied by U. S. Weather Bureau).

HAWAII INSECT REPORT

Cereal and Forage Insects - A GRASSHOPPER (Schistocerca vaga) - A gravid female collected at Nanakuli Fire Station, Oahu. This is second specimen at this location since spread from Sand Island, Oahu.

Fruit Insects - CHINESE ROSE BEETLE (Adoretus sinicus) adults caused light to moderate damage to foliage of Syzygium cumini (Java-plum) in Kekaha, Kauai, and to citrus trees in Kaneohe, Oahu.

Truck Crop Insects - BEAN POD BORER (Maruca testulalis) larvae light to moderate on string beans in Hilo, Hawaii Island. Larvae of a NOCTUID (Chrysodeixis chalcites) moderate and caused noticeable defoliation on tomato plants in Hilo, Hawaii Island. A GRASSHOPPER (Atractomorpha ambigua) caused light damage to white mustard cabbage and radish in Hanapepe and Olokele, Kauai. CHINESE ROSE BEETLE (Adoretus sinicus) adults caused light foliar damage to beans in Kekaha, Kauai, and in Kaneohe, Oahu, and to eggplants in Kekaha. A TARO LEAFHOPPER (Tarophagus proserpina) ranged from trace to light on taro plants in Hanapepe, Kauai. Medium to heavy outbreaks of ONION THRIPS (Thrips tabaci) caused moderate damage to green onion plants in Olokele (Makaweli) Gardens, Kauai.

Forest, Ornamental and Shade Tree Insects - COTTONY-CUSHION SCALE (Icerya purchasi) ranged light to moderate on Ficus benghalensis (Indian banyan) from Lahaina to Olinda, Maui; light on Ficus retusa (Chinese banyan) at Lanikai, Oahu. A CONIFER TWIG APHID (Cinara carolina) light on Pinus taeda (loblolly pine) in Olinda, Maui. AN APHID (Thoracaphis fici) ranged moderate to heavy on Ficus retusa and F. benghalensis from Lahaina to Olinda, Maui. A TWIG-BORING BARK BEETLE (Xylosandrus compactus) very active on Prosopis pallida (mesquite) in Honouliuli, Oahu. Many dead and dying twigs observed over linear mile. First record of X. compactus in this locality. A WHITEFLY (Dialeurodes kirkaldyi) light on Plumeria sp. leaves in Honolulu, Oahu.

Insects Affecting Man and Animals - SOUTHERN HOUSE MOSQUITO (Culex pipens quinquefasciatus) adults light in Honolulu vicinity and in central and northern sections of Oahu; moderate in Waialua and in northeastern and southwestern sections of Oahu.

Beneficial Insects - Eggs, larvae, and adults of A LADY BEETLE (Coelophora pupillata), an aphid predator, very numerous on Ficus benghalensis infested with Thoracaphis fici in Lahaina and Olinda, Maui. A TACHINA FLY (Trichopoda pennipes) - Collections of Nezara viridula var. smaragdula (southern green stink bug) adults from 2 acres in Hilo, Hawaii Island, showed that 100 percent of bugs bore tachina eggs. A NOCTUID MOTH (Hypena strigata) - Larval activity heavy on foliage of Lantana camara var. aculeata in Kukuiula, Lawai-Kai, Numilo and Lawai Valley, Kauai; 50-75 percent of leaf surface eaten. (Hawaii Ins. Rpt.).

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1965

(continued from page 96)

CEREAL AND FORAGE INSECTS (continued)

CORN, SORGHUM AND SUGARCANE INSECTS

Highlights:

EUROPEAN CORN BORER caused generally lighter to much lighter damage to corn in the Nation's Corn Belt. Areas and States on the outer limits of its known distribution and Maryland and Delaware had damaging numbers. Ironically, Massachusetts, the State in which this pest was first discovered in 1917, reported very low populations with no reports of damage. Controls for CORN EARWORM were necessary on sweet corn throughout the Nation and often on field corn, particularly in more southern areas. Other noctuids were more troublesome in northern areas on corn with outbreaks occurring in several States. CORN ROOTWORMS (Diabrotica spp.) caused considerable difficulty. These pests have spread to new areas, show resistance to certain insecticides and built up populations in spite of unfavorable weather. Millions of acres were treated in the Corn Belt. CORN LEAF APHID was the most commonly reported aphid on corn; CORN ROOT APHID was a minor problem locally. Drought conditions in several areas increased the threat of CHINCH BUG damage but most of these failed to develop; the fall survey indicates that chinch bug will not be serious in 1966 in most areas. Planting dates are important in reducing SORGHUM MIDGE attacks.

EUROPEAN CORN BORER (Ostrinia nubilalis) caused considerable damage to field and sweet corn in western and Northwestern ALABAMA. Populations were above normal during most of the season in MARYLAND; in general, corn planted before May 10 was moderately to heavily infested. The spring population of 78 borers per 100 stalks represented an 80 percent survival of overwintering borers in DELAWARE; this was much higher than in the spring of 1964. Pupation of overwintering borers was first noted April 20; first adults occurred in blacklight traps May 3. The State average of 209 borers per 100 corn plants was twice that of 1964. This is the third consecutive year of increase in Delaware; these high infestations were reflected in damage to sweet corn and peppers as well as field corn. European corn borer was light to moderate on sweet corn throughout NEW JERSEY. Infestations were generally low in PENNSYLVANIA but some infestations in the southeast reached 5-6 per stalk. Populations were very low in MASSACHUSETTS, with no reports of damage. European corn borer was general in RHODE ISLAND but the degree of injury was probably related to the efficiency of control procedures. The overall average percent of plants infested in VERMONT was 5.6, an increase over the 4.3 percent in 1964. Light populations and damage were noted in Jonesboro, MAINE, in early July.

The fall European corn borer survey in OHIO indicated that populations were considerably lower than in 1964 in 33 counties. The average population of 11.1 borers per 100 plants was 16.9 less than that of 1964. Estimated losses totaled $589,176, low for Ohio. Activity was noted from April through October. First emergence occurred at the end of May. A few heavily infested fields were noted in Brown, Clermont, Preble and Fairfield Counties, Ohio. First-brood moths appeared in blacklight traps the last week of May in MICHIGAN. Largest collections were made the second and third weeks of June. Statewide injury from first and second-brood larvae was relatively light in field corn. Highest counts, less than 1 per stalk, were noted in Branch and Barry Counties. Population densities were noticeably lower in INDIANA. Statewide, 25.8 percent of plants sampled were infested. Loss to corn was placed at 1.1 percent. A wet spring in ILLINOIS delayed corn planting but did not arrest European corn borer development. Eggs were laid on corn too small for good borer survival. Strong winds during hatch caused many egg masses and new larvae to drop off corn leaves, resulting in a first-generation population of 3.13 borers per 100 plants, the lowest since surveys for that generation began in 1955. A second generation of 57 borers per 100 plants was the lowest recorded since 1952. Although the State average showed a large decrease, the decrease actually occurred north of a line from Alton to Champaign and in Pulaski and Alexander Counties.

European corn borer populations in WISCONSIN were the lowest recorded in that State; records from 1942 through 1965 show that O. nubilalis has been decreasing slowly since 1945 except in a few unusual years. Pupation began in mid-May, emergence began by early June and egg laying was underway by mid-June. First instars were noted June 25, with some adults present by early August in southern areas. Egg laying began in early August but was extremely light; damage too, was light but some controls were used. Overwintering mortality in MINNESOTA averaged 28 percent in the spring survey, slightly above normal. Cool, wet weather in the spring extending through the season had a marked effect on first and second generations. The first generation was late and light, and second-generation moths appeared late. This, with about 5 weeks of very cool and wet weather in August and September, resulted in extremely low egg laying and borer survival. A few scattered fields had relatively high numbers. During the fall survey in October, only 1-2 fields showed any second generation present. The outlook for 1966 in Minnesota is for lower populations throughout the State. Development of this pyraustid moth was slow in NORTH DAKOTA; the fall population in the southeast was low compared with the past few seasons. Survey showed 64.53 percent of plants infested with 1.08 borers per infested plant, or 84.07 borers per 100 plants inspected. Populations generally decreased in SOUTH DAKOTA; the winter mortality survey conducted in mid-April in 12 southeastern counties showed that average mortality was 54 percent (range 15-90 percent), although the winter was severe. Diadegma punctoria (an ichneumon) and Sympiesis viridula (a eulophid) contributed to mortality of O. nubilalis. First moths were taken in light traps at Brookings on June 22 and by July 2 larval feeding was noted in whorls of corn plants in Clay and other southeastern counties. One week later, second instars detassled 10 percent of the sweet corn in an early field in Hutchinson County. Damage reported the last 2 weeks of July indicated that a few fields had up to 50 percent of the stalks damaged in Charles Mix and other southeast counties; up to 80 percent of the whorls of these plants showed feeding injury. The fall abundance survey from October to mid-November (following killing frost in September) indicated that the average number of borers per 100 stalks declined for the third year. Exceptions were noted in the Deuel-Hamlin County area and along the southern part of the State in Bon Homme, Yankton and Clay Counties. Nearly all damage observed in the field was attributed to first-generation larvae in South Dakota.

European corn borer populations and damage decreased in all sections of NEBRASKA except in the southeast and southern areas where an increase with heavy damage was noted. Peak flights occurred June 11-18 and August 13-20. Damage to corn and sorghum in KANSAS was not severe. Populations, as shown by the fall survey, were very low and somewhat less than those of 1964. Pupation of overwintering forms began about April 10 in southeast MISSOURI; the first moth was taken May 8. First-generation larvae entered stalks about June 12 and the second about July 25. The percent of infested stalks increased 5.2 over the 1964 average of 55.9 percent. The number of borers per 100 stalks decreased 12.2 percent (157.2 percent in 1964). Heaviest damage occurred in Atchison, Holt and Nodaway Counties (northwest), Linn and Randolph Counties (north central), Clark, Knox and Marion Counties (northeast) and Dunklin, New Madrid and Stoddard Counties (southeast). Losses in Missouri were estimated at 10,178,500 bushels. European corn borer increased slightly in ARKANSAS over that of 1964. Overwintering borers averaged 2,679 per acre (2,404 in 1964). O. nubilalis was economic in a few fields only. Borers became numerous in late-planted sorghum heads causing up to 41 percent broken heads. Examination of corn and sorghum in a survey in NEW MEXICO failed to reveal this pest. See CEIR 16(2):21-27 for status report for fall 1965.

GARDEN WEBWORM (Loxostege similalis) was very abundant in early summer in KANSAS where it damaged sorghum, corn and other crops; populations declined and little additional damage occurred. A PYRAUSTID MOTH (Marasmia trapezalis) caused some damage to sugarcane in FLORIDA.

CORN EARWORM (Heliothis zea) continued as a definite pest of corn in FLORIDA and insecticides were required to minimize damage. It caused light to medium damage to corn in all counties of ALABAMA; sweet corn was heavily attacked. Moderate to heavy infestations in whorls of corn were noted in GEORGIA during the first half of the season. Infestations in corn were medium in VIRGINIA and about normal in MARYLAND. Heavy ear infestations occurred in late August and September in all sections of Maryland. The first adults of the season in DELAWARE were collected in blacklight traps May 26 in Sussex County; by mid-June, 3 per night were taken with young larvae common on early sweet corn. Only light, scattered infestations occurred in MASSACHUSETTS. These were mostly in the eastern area late in the season. In RHODE ISLAND, the degree of local injury was probably related to control efficiency.

Corn earworm was a pest of minor significance in OHIO on corn. A single female taken in blacklight trap on June 4 was the earliest MICHIGAN record for this species. A few larvae were noted in sweet corn before the main influx of moths entered the State. Blacklight trap data showed that the first large-scale flight of the season was delayed until September 21 (an extremely late date). Although too late for major importance on sweet or field corn, early instars were quite common in fields sampled September 30-October 14. Infestations were slightly higher than in 1964 in INDIANA. The fall corn insect survey revealed that statewide, 11.6 percent of the corn plots sampled were infested compared with 9.4 percent in 1964. Heaviest infestations occurred in the southern third of the State where an average of 15.7 percent of the corn examined was infested. This noctuid was not nearly so abundant in ILLINOIS as in 1964; however, 100 percent of the ears was infested in some late corn fields in the southern section in late August and early September. Survey of damage in the southern quarter of the State in September showed only 0.057 percent actual loss to field corn. The first H. zea moths were taken in blacklight traps in mid-June in WISCONSIN; egg laying was noted in late June. Some fields of fresh market sweet corn had up to 30 percent of the ears infested by small larvae. Infestations in canning corn did not exceed 5 percent.

Corn earworm accounted for some loss in corn yields in SOUTH DAKOTA; increasing numbers were found July through September in corn ears. Third to fourth instars were feeding in less than 1 percent of the ears examined by the end of July in Turner County. By mid-September, 20 percent of the cobs in fields in Tripp County and 40 percent in Yankton County were infested. This was one of the major pests of corn in COLORADO. Populations were high in early sweet corn in NEBRASKA in July and moderate numbers caused some damage to field corn in central and southwestern areas. Corn earworm was light in the southeast. In KANSAS, populations were normal with 100 percent infestations in sweet corn at harvest common in the northeast; no severe damage occurred on sorghum owing to late heading of plants. The first moth of the season was taken in Pemiscot County, MISSOURI, April 22. Infestations were noneconomic with damage slightly less than in 1964. It was economic in poorly managed sweet corn in Missouri, with losses about the same as in 1964.

Corn earworm, infested a wide variety of crops in ARKANSAS and was the State's number-one pest. The first moth was taken in a light trap in the southeast March 29, eggs appeared April 6 on crimson clover in the southern area. This pest was moderate to heavy in late-planted milo but milo planted early escaped damage. The highest infestation was 137 larvae in 100 heads on 29 row feet; this is 4.69 per row foot or 60,928 per acre. This is considered economic on milo. Activity began in OKLAHOMA in early April and light to moderate numbers damaged corn and alfalfa during May and June. By late July, moderate numbers were on corn, grain sorghum and other crops in much of the State. Occasional heavy infestations were found in corn and grain in August. Activity continued until early October. This pest was not so serious in Oklahoma as it usually is, although damage to sweet corn occurred from late May to mid-September. Damage to sweet and field corn occurred over TEXAS. Damage to corn was noticeable in NEW MEXICO and larvae fed in whorls and on ears of field corn in most areas. Heavy corn earworm populations damaged corn in June and July in ARIZONA. Corn earworm was prevalent in corn, sorghum and milo in CALIFORNIA from May through October where it caused considerable damage to stalks as well as heads. Populations were moderately high with damage general to home gardens in UTAH; corn for canning and field corn was also damaged. This pest was present over a large part of MONTANA during the season and caused heavy damage to late maturing sweet corn in Douglas County, OREGON.

FALL ARMYWORM (*Spodoptera frugiperda*) was general and severe in some local areas and fields in PENNSYLVANIA; development was slow with continued damage to replanted corn noted. This pest was light to moderate on sweet corn in NEW JERSEY and moderately severe on field corn in the northern half of the State. Infestations on late-planted corn were conspicuous but spotty in most sections of MARYLAND, with a few fields over 25 percent infested. This noctuid was light on corn throughout the year in VIRGINIA and light to moderate in the whorls of corn in GEORGIA during the first half of the year. This was a major pest of late corn in most counties of ALABAMA, and attacked sweet corn in most areas.

Fall armyworm was observed in late field corn, sweet corn, sorghum-Sudan grass and other crops in several OHIO counties in September. This pest infested 4-80 percent of the plants and about 4 percent of the ears of late corn (3-4 percent of crop) in southern ILLINOIS. An estimated 21,651 acres were treated. Fall armyworm was slightly lighter in ARKANSAS than in past years; earliest season record occurred on sorghum in early July in southeast. Fall armyworm became active by mid-July in OKLAHOMA and moderate to heavy numbers damaged corn, grain sorghum and broomcorn until late September. This pest was generally light in corn in southeast and central NEBRASKA. Caused moderate damage to a few late-planted fields in southeast counties where populations were higher than in 1964. This pest caused losses to corn in COLORADO. Light to moderate infestations were found in corn fields of Platte County, WYOMING. Slight damage developed on field corn and more severe damage appeared on sweet corn. The first specimens were taken on July 22 and 8 plants in 100 were found infested in most heavily infested fields.

BLACK CUTWORM (*Agrotis ipsilon*) damaged corn and other crops in MICHIGAN. Economic infestations occurred in corn in localized areas throughout central INDIANA. A 40-acre field in Tippecanoe County was completely destroyed and an adjacent 100 acres required treatment. Infestations were more widely distributed in central Indiana in 1965 than in the past few years. This noctuid was responsible for severe damage to corn in all districts of ILLINOIS; an estimated 265,320 acres of corn were replanted and 411,633 acres were treated after corn emerged in Illinois. Moths appeared in Madison, WISCONSIN, blacklight traps the second week of May. Some damage to field corn occurred in early June. Adults were more numerous in July light trap collections than in July 1964. This indicated a possible outbreak, but no significant damage was reported. This noctuid, as well as others, was commonly found in home gardens in Wisconsin. *A. ipsilon* was scattered and very localized in southern MINNESOTA. Infestations were much lower than in 1964 but some damaged fields required replanting. Light to moderate infestations occurred in some areas of southeast NEBRASKA and damage to young corn and sorghum necessitated replanting. The first moth of the season in MISSOURI was noted in Pemiscot County April 7. Larvae caused light to heavy stand reduction in corn statewide. Heaviest damage occurred in the northern half of Missouri where stand reduction ranged up to 100 percent in some fields. This cutworm damaged seedling corn in south central KANSAS in early summer and some damage was noted in OKLAHOMA. Larval damage to corn in NEVADA varied from light to heavy in Churchill and Pershing Counties, especially in the latter county in late June and early July. Damage occurred on corn in Kings, Orange, Santa Cruz and San Joaquin counties, CALIFORNIA.

ARMYWORM (Pseudaletia unipuncta) outbreaks occurred in late May on the Eastern Shore of MARYLAND with extensive damage noted on corn, pastures and small grains. Many fields required teratments. Scattered infestations in seedling corn were noted in Washington, Dubois, Gibson and Knox Counties, INDIANA, during May and June. This pest was not so abundant in ILLINOIS as it was in 1964. During the year, 14,716 acres of corn were treated. Armyworm damaged some corn in MISSOURI and caused considerable damage to corn in COLORADO; it damaged corn in many CALIFORNIA locations and Sudan grass in Merced County.

VARIEGATED CUTWORM (Peridroma saucia) damaged corn throughout much of WASHINGTON and ALFALFA LOOPER (Autographa californica) was unusually abundant and damaging to corn in that State. Larvae, tentatively identified as SORGHUM WEBWORM (Celama sorghiella), damaged a field of sorgho (sorghum X Sudan grass) in Turner County, SOUTH DAKOTA, with controls necessary. Light populations of WESTERN BEAN CUTWORM (Loxagrotis albicosta) caused considerable damage to corn in some central NEBRASKA fields. YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) was light in Nebraska and caused very little damage to sorghum in the southwest. Sorghum webworm caused some damage in OKLAHOMA. Sorghum webworm was light to moderate on sorghum in several southern and south central areas of TEXAS. In MISSOURI, yellow-striped armyworm, STALK BORER (Papaipema nebris) and DINGY CUTWORM (Feltia subgothica) damaged corn. P. ornithogalli was found in light numbers in a few MINNESOTA corn fields. This species has been found before in Minnesota but this is considered a rare occurrence. Stalk borer was found in the southern half of Minnesota, with moderate to heavy marginal feeding noted in some fields. GLASSY CUTWORM (Crymodes devastator) injured corn by cutting plants below the soil surface in some fields in MICHIGAN. Both glassy cutworm and CLAY-BACKED CUTWORM (Agrotis gladiaria) damaged young corn in OHIO; the first reports of damage occurred May 17 and continued through most of June. Significant infestations occurred in 16 widespread counties with up to 75 percent of young plants in some fields cut. Clay-backed cutworm and glassy cutworm were general and severe in local areas and fields of PENNSYLVANIA. Development was slow and there was repeated damage to replanted corn. Clay-backed cutworm was especially destructive to young corn planted after sod in several areas of MARYLAND. In MAINE, moderate to heavy numbers of various CUTWORMS caused moderate damage to corn in the central area.

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) larvae caused heavy damage to many corn fields and late sorghums in Maricopa, Pinal, Graham and Cochise Counties, ARIZONA. Peak numbers occurred in July and August. Numbers were low in KANSAS and little damage was reported. Occasionally heavy infestations occurred in corn in southwest and south central OKLAHOMA in late September and early October. In TEXAS, severe damage occurred on experimental corn plots in Hardeman and Hale Counties. Populations were lighter in ARKANSAS than in 1964 but heavier than in 1963. The number of lodged stalks per acre in Arkansas were: 1963 - 180, 1964 - 588 and 1965 - 417. Percentages of stalks lodged for the same years were: 2.2, 8.5 and 6.2. Moths from first-generation larvae were 50 percent emerged in late June in the southeast and moths of second-generation larvae emerged in late July, thus giving rise to a third larval generation in Arkansas. Southwestern corn borer was found in Hardin County, ILLINOIS, bringing the known infested counties of that State to 7. A fall survey in the southern tip of the State revealed that 100 percent of the fields and an average of 9.45 percent of plants were infested in Alexander County. Pulaski County had 85.7 percent of these fields infested (1.29 percent of plants); Massac County had 80 percent of the fields infested (0.67 percent of plants); Union, Johnson, Pope and Hardin Counties had 12.5 to 33.3 percent of the fields infested and 0.08 to 0.33 percent of the plants infested. No infestations were found in Randolph, Jackson, Williamson, Saline and Gallatin Counties. Southwestern corn borer was found for the first time in Dallas and Madison Counties, ALABAMA, and it is now found in 28 counties. Larvae caused considerable damage to field and sweet corn in the western and northwestern sections. SUGARCANE BORER (Diatraea saccharalis) was light on sugarcane at Belle Glade, FLORIDA, apparently the result of biological control by Trichogramma spp. (minute egg parasites). SOUTHERN CORNSTALK BORER

(D. crambidoides) destroyed a 50-acre field of corn in GEORGIA. D. crambidoides caused considerable damage to field and sweet corn in western and northwestern ALABAMA. D. saccharalis was noted on corn in the gulf coast and Rio Grande Valley areas of TEXAS.

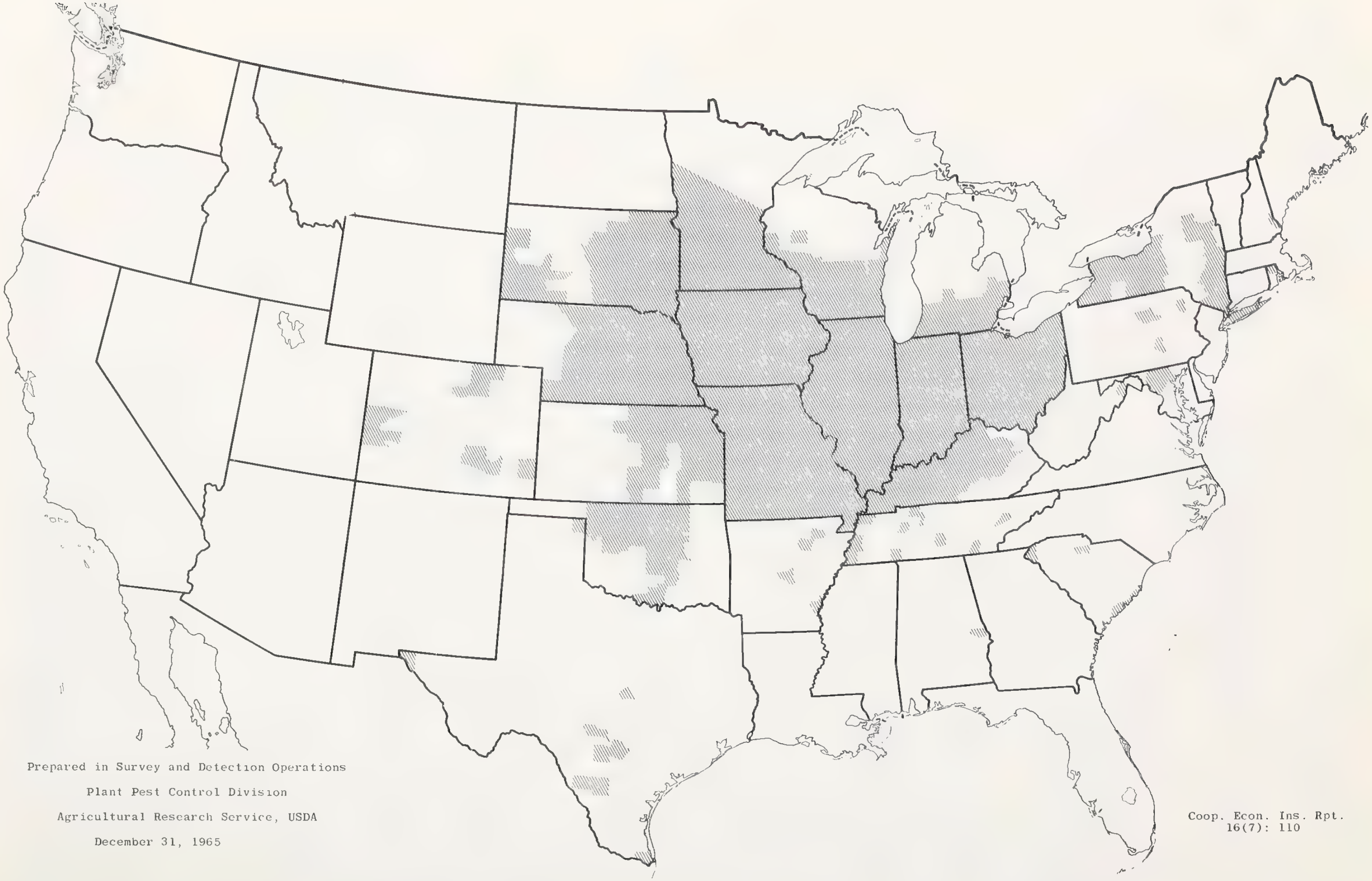
CORN ROOT WEBWORM (Crambus caliginosellus) infested young corn planted after sod in MARYLAND; replanting was necessary in several instances. Economic infestations on young corn occurred in OHIO from late May through mid-June. Activity was general with noticeable infestations occurring in 10 counties. Crambus spp. were a problem on corn following sod but caused only minor lawn damage in Ohio. SALT-MARSH CATERPILLAR (Estigmene acrea) larvae were abundant in ILLINOIS. Up to 10 percent of the ears had damage to silks in the Decatur-Springfield-Lincoln area of central Illinois in July; some fields were treated. A SOD WEBWORM (Thaumatopsis pectinifer) appeared in moderate numbers and damaged some corn fields in Antelope County, NEBRASKA, in June, the first buildup of this crambid moth since 1948. LESSER CORNSTALK BORER (Elasmopalpus lignosellus) was light to moderate but widespread on corn in the Rio Grande Valley of TEXAS.

Eggs of CORN ROOTWORMS (Diabrotica spp.) hatched June 21 in central and southwestern MINNESOTA. Hatch extended over a 6-week period but the peak probably occurred the last week in June and first week of July. Lodging of corn appeared in early July. NORTHERN CORN ROOTWORM (D. longicornis) appeared to hatch and develop ahead of WESTERN CORN ROOTWORM (D. virgifera). The first corn rootworm adults appeared in the central area the week of July 19. It became apparent in July that populations of both D. longicornis and D. virgifera were down in southwestern Minnesota; however, D. longicornis increased in central and southern districts. These observations were confirmed in a survey in August made to determine the percent and population level of these two species in 42 counties in the southern half of the State. The percent of D. virgifera was high only in Rock, Jackson and Watonwan Counties, a reverse of the 1964 observations when this species gradually diminished in numbers in north and east directions. Complete reversals in percentages occurred in Nobles, Murray and Cottonwood Counties where D. longicornis is again dominant. The probable cause of drop in population of western corn rootworm in southwestern Minnesota is believed due to the extremely wet season; increased use of organic phosphates in the area can also be considered a factor. Damaged fields were present throughout the southwest district but damage was less than that of 1964. The number of damaged fields increased in the central and southeast; only D. longicornis is involved in that area of Minnesota. D. virgifera and D. longicornis were the dominant rootworm species in SOUTH DAKOTA in 1965; SOUTHERN CORN ROOTOWRM (D. undecimpunctata howardi) has been implicated least in crop damage in the State. The first rootworm adults of the season were observed in alfalfa in Hutchinson County. From June to mid-October southern corn rootworm adults were taken from various crops including corn, alfalfa and wheat. Observations of mating indicate that the common cross was between male D. longicornis and female D. virgifera. The first corn rootworm adults appeared in the southern tier of counties July 7 and although this date is similar to that of 1964, the main hatch and larval buildup was 10 days later than that of 1964. This was undoubtedly influenced by a cool spring and ultimately led to extended larval feeding with lower concentrations of adults in a field at any one time. At the end of July, heavily infested fields in Bon Homme, Charles Mix, Hutchinson, Turner, Lincoln, Clay, Yankton and McCook Counties had 15-20 per silk. About one million acres of corn were treated for rootworms; better growing season further enhanced yields.

Western corn rootworm was light in COLORADO and few controls were needed. Large numbers of adults of D. virgifera and D. undecimpunctata howardi were found infesting corn in Goshen and Platte Counties with damage comparable to that of 1964. Infested fields ranged 8-12 adults per plant with slight larval feeding. Adults began feeding on silks August 11. Western corn rootworm was present in MONTANA but it was 50 percent controlled along the Yellowstone River near Billings.

Western corn rootworm was the dominant species in NEBRASKA. Indications of increased activity appeared in the central and southwest with decreases noted in the

Distribution of Northern Corn Rootworm



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northeast. Statewide populations appeared lower than in 1964. D. longicornis was dominant in some northeastern counties where some damage was noted; populations were greater and more widespread in that area. D. undecimpunctata howardi populations were widely separated in the southeast, east and central areas and little damage to corn and sorghums was noted although numbers were in general higher and more widespread. In KANSAS, populations of D. undecimpunctata howardi, D. longicornis and D. virgifera were generally lighter than in other years; very little damage occurred. A few fields in extreme northeast Kansas had very high populations and severe lodging occurred; fields had been treated with recommended insecticides. D. virgifera spread into 6 additional counties in MISSOURI during 1965. The first larvae of the season were found in Atchison County June 12. Emergence began about July 17. Damage in Missouri ranged up to 100 percent of plants with 10-95 percent of the plants lodged in untreated fields. Losses in the area infested in 1964 ranged slight to heavy in 1965; no attempt was made to harvest corn in some fields. Southern corn rootworm heavily damaged corn seedlings in local areas of Brazos County, TEXAS.

Corn rootworms caused some damage in fields planted to corn in preceding years in WISCONSIN that had not received preventive soil insecticides. D. longicornis adults emerged in mid-July and continued until mid-August. Populations were high in some fields and fed extensively on corn silks. D. undecimpunctata howardi was generally distributed, often being the only species observed in a field. D. virgifera (first detected in Wisconsin in 1964) was found in Crawford and Vernon Counties as well as in St. Croix County. D. longicornis adults were common in many corn fields of ILLINOIS during July and August. Larvae caused some lodging of corn. A survey for resistant northern corn rootworm conducted in the northern half of the State indicated that resistance is common where fields were planted to corn for several years and soil insecticides were also applied for several years. There was no indication that the general population of D. longicornis over a large area is resistant. D. virgifera was found in 5 additional counties in Illinois; the heaviest population of western corn rootworm was found in Mercer County field with 32 adults per 100 plants.

D. virgifera damage occurred throughout INDIANA. Emergence began by July 10 in the south and by July 23 adults increased to 1-2 per silk. Some fields in east central and southeast sections had 10-15 per silk. Scattered adult infestations were reported in all areas by July 30. Severe windstorms in the northwest in late August caused heavy lodging in infested fields. A slight increase in number of infested fields over that of 1964 was noted in MICHIGAN. Of 70 fields checked in 14 counties, 3 percent harbored moderate infestations; 6 percent were lightly infested. Emergence began in late July in Washtenaw County. A survey in 35 OHIO counties in late August and early September revealed 153 fields (5.5 percent of 2,776 examined) had high populations; adults were found in every field checked, indicating potential high infestations where corn follows corn. The first larval activity occurred in late June, first adults were noted in mid-July; adult activity ceased near the end of September. Southern corn rootworm was insignificant.

Northern corn rootworm was found for the first time in several localities in northern DELAWARE during late August. Adults of northern corn rootworm were not so common on corn silks in central MARYLAND as in previous years; however, southern corn rootworm was responsible for a moderate amount of field corn lodging in Frederick and Carroll Counties. Light infestations of southern corn rootworm were present in corn and peanuts in VIRGINIA but only slight damage resulted. This rootworm was slightly higher in test plots in northeastern NORTH CAROLINA; however, the population was the lowest since 1960.

CORN FLEA BEETLE (Chaetocnema pulicaria) was heavy on young sweet and field corn during May and June in MARYLAND, and heavy on late corn during July and early August. This flea beetle severely attacked young corn in the southern half of PENNSYLVANIA; it was quite heavy in southeast and southwest sections on sweet corn. The first infestations in OHIO were noted on young corn May 10. Infestations continued through August. Significantly heavy infestations were noted in 13 counties representing most of the State. Controls were required in many areas of southern INDIANA in late May where adults ranged 2-11 per corn plant. Late corn was attacked in Jay County area requiring replanting of several fields in June. Populations in other central areas and in northern areas were light to moderate. Corn flea beetle was rather abundant on late corn in southern ILLINOIS; 5-10 per plant were common. An estimated 35,951 acres were treated for control. This pest damaged corn in MISSOURI but it was of no economic importance in KANSAS; it caused some damage in OKLAHOMA. Unspecified FLEA BEETLES damaged grain sorghum in several central counties of TEXAS.

A WIREWORM (*Melanotus communis*) caused considerable damage to corn in Camden and Pender Counties, NORTH CAROLINA, during late May. Larvae were very abundant in the Camden County field; some pupation noted there May 27. WIREWORMS damaged some fields of late planted corn in Carroll County, VIRGINIA, in late July. Some young corn was heavily injured in Anne Arundel and Queen Annes Counties, MARYLAND; wireworms were minor in OHIO on corn. Several species of wireworms damaged corn in MISSOURI. A heavy infestation of wireworms destroyed a stand of corn in Hamlin County, SOUTH DAKOTA, in June; low numbers of larvae (1 per hill) damaged corn in Kingsbury County. Wireworms caused some damage to corn in northeast COLORADO. *Limonius* spp. were responsible for damage to corn in many localities of the Willamette Valley of OREGON.

A WEEVIL (*Anacentrinus deplanatus*) caused light, local damage to grain sorghum fields in Denton County, TEXAS. Several species of BILLBUGS damaged corn in MISSOURI. MAIZE BILLBUG (*Sphenophorus maidis*) was a minor corn pest in OHIO. *S. callosus* infestations were light to heavy in GEORGIA but more severe than in 1964.

Other coleopterous pests of corn reported included SEED-CORN BEETLE (*Agonoderus lecontei*) in NORTH DAKOTA where a severe infestation was found on newly planted corn in Cass County. This pest also caused some loss to corn in COLORADO. In ILLINOIS, a SAP BEETLE (*Glischrochilus quadrisignatus*) was very abundant in corn fields attacked by *Blissus leucopterus* (chinch bug); some fields had 20 or more adults per plant clustered under leaf sheaths with *B. leucopterus*. SAP BEETLES were corn pests of minor importance in OHIO as was *A. lecontei*. ROSE CHAFER (*Macrodactylus subspinosus*) infested a corn field in Lucas County in late June; but this was a minor pest of corn in most of Ohio.

CORN LEAF APHID (*Rhopalosiphum maidis*) infestations were first noted in field corn in Clermont County, OHIO, July 7; it was found in Auglaize and Highland Counties the following week. This aphid was general over much of the State with a few fields having up to 70 percent of the plants infested. Early infestations prevented ears from filling. CORN ROOT APHID (*Anuraphis maidiradicis*) was a minor corn pest in Ohio. High populations of *R. maidis* developed over the entire corn-growing area of MICHIGAN from July 21 until August 2. A high percent of the corn suffering from drought during this period made losses caused by this aphid difficult to measure. Natural control, notably lady beetle adults and larvae, brought about rapid reduction of numbers in mid-August. Statewide in INDIANA, 7.4 percent of the corn plants sampled were severely infested, 23.5 percent were moderately infested and 34.5 percent were lightly infested. Maximum infestations occurred in the northern three-quarters of the State where an average of 74 percent of the corn plants were infested; the average was 36 percent in the southern quarter of Indiana. Corn leaf aphid was very abundant in ILLINOIS. Only trace numbers were noted July 12-13; however, infestations July 19-22 ranged from very small to heavy colonies causing some discoloration of leaves or tassels. Thirty-one percent of the corn plants were infested July 26-29 in the northern section with 100 percent of the plants infested in some fields. An estimated 55,333 acres of corn were treated to control this pest in Illinois.

Corn leaf aphid colonies were first observed in WISCONSIN in early July and were abundant in many areas by late July. As much as 20 percent of plants in some fields had colonies of 500 or more aphids. Populations decreased markedly in early August owing to washoff by rains and dispersal of winged individuals, but before some treatments were made. Populations became extremely low in late August. This aphid caused great concern to many corn growers in MINNESOTA in July. Populations were high but barren stalks or reduced ear size did not result. Predators and parasites multiplied slowly due to cool weather but they did exert some control in August. This aphid was relatively common and prevalent in southeastern SOUTH DAKOTA corn fields from July through mid-August. The aphid, although numerous and sometimes present in damaging numbers, was contained by predators. Chemical control was not recommended. At the beginning of July, 50 percent of the cornstalks had 100 to 150 aphids per stalk; one week later this population increased to over 300 per tassel. A heavy flight occurred at Brookings August 3-6. Anuraphis maidiradicis was present in low numbers in southeastern South Dakota from mid-June through July. The highest numbers (25 per stalk) of this aphid were recorded in Hutchinson County where corn-on-corn rotation was practiced.

Corn leaf aphid caused little damage to sorghum in NEBRASKA; light to moderate populations were present on corn in late July and early August. Populations were lighter than in 1964. Light to moderate populations were noted in some areas of central and eastern Nebraska. Corn leaf aphid damaged some corn in MISSOURI. Moderate levels of corn leaf aphid, with some reports of damage to young field corn, were noted in north central KANSAS in early summer. Moderate to heavy numbers with damage were noted on corn and grain sorghums in most areas of OKLAHOMA from mid-May to late August. Corn leaf aphid was economic on sorghum and other crops in COLORADO. Populations were slightly smaller in corn in WYOMING than they were in 1964. The first specimens of the season were taken in Platte County July 22. Fields averaged 15 percent infested in the southeast area and 12-20 percent infested in northern areas. Damage was reported on corn and barley in CALIFORNIA in San Diego, Butte and Fresno Counties.

Corn leaf aphid was common in late summer in RHODE ISLAND. Large populations developed on sweet corn throughout central and eastern MASSACHUSETTS and many growers complained of sooty mold on honeydew. Corn leaf aphid attacked sweet corn in all areas of ALABAMA.

CHINCH BUG (Blissus leucopterus) was present on corn in southeast areas of PENNSYLVANIA. Infestations on peripheral rows of corn became a problem in late June in OHIO and continued through early October. The hot, dry weather encouraged development of high populations; 14 Ohio counties reported significant infestations with some infestations on Sudan grass and sorghum. Heavy infestations occurred in corn from June 20 through July 16 in eastern and western INDIANA. The infestations in western counties were individually more severe but the infestations in eastern counties were more extensive.

The outbreak in east central Indiana was the most severe in 15 years. The fall chinch bug survey indicated that hibernating populations are generally at subeconomic levels; however, 4 out of the 59 bunch grass samples collected from eastern and western Indiana contained light populations (250-500 per square foot) and one sample had a very severe (8,625 per square foot) hibernating population. The very severe infestation occurred near Newport, Vermillion County, and the moderate population near Spartanburg, Randolph County. Lighter populations were found in Benton, Vermillion and Jay Counties, Indiana. Recently hatched nymphs were found in both central and eastern districts of ILLINOIS by June 1. Heavy migrations to marginal rows of corn occurred; treatments were applied. By July 15, late instars and adults varied from none to severe on marginal rows of corn bordering wheat with some corn showing stunting and purpling. Although the first generation was more severe and widespread than in 1964, the second generation failed to develop and there was no damage in August and September. The fall chinch bug survey in Illinois indicated that areas of economic infestation were much smaller and the population considerably lower than in 1964. An estimated 45,184 acres of corn were treated. Chinch bug damaged corn in MISSOURI in 1965. The 1964 chinch bug survey in KANSAS indicated populations would be very low and as expected they remained low throughout the summer. The 1965 survey again resulted in low counts; little trouble is expected in 1966 in Kansas. Damage by chinch bug began in mid-May in OKLAHOMA and continued until late September. Numbers were generally light in all areas except the northeast where moderate to heavy numbers damaged corn and grain sorghum from late May to late August. Populations in TEXAS were similar to those of 1964; damage was reported over much of the State, particularly the gulf coast region.

RICE STINK BUG (Oebalus pugnax) is of less importance in rice in ARKANSAS with the current good grass control. Adults and nymphs were found at rates of 4,400 and 3,500 respectively in heads of late planted grain sorghum. STINK BUGS damaged sweet corn in all areas of ALABAMA during the season. Peak populations of LYGUS BUGS (Lygus spp.) occurred in sorghum in early June in ARIZONA but they caused little economic damage; moderate amounts of controls were needed.

SORGHUM MIDGE (Contarinia sorghicola) was heavy in milo in Kings County, CALIFORNIA. Heavy numbers on late planted sorghums caused extensive damage and yield losses in Cochise County, ARIZONA; infestations were light in Greenlee and Graham Counties. In TEXAS, infestations were less severe than in 1961, 1962 and 1963; they closely paralleled the 1964 infestation. Late planted fields, as usual, received heavy damage in some areas. The effect of planting dates on sorghum midge infestations showed that sorghum planted April 10 and 30 escaped this gall midge in ARKANSAS while sorghum planted May 20 suffered 50-75 percent damage. A few fields planted mid-June to early July and inspected periodically did not become infested. This fly caused some damage in OKLAHOMA. Sorghum midge was collected in Johnson County, KANSAS, which was the second county record in recent years. CORN BLOTCH LEAF MINER (Agromyza parvicornis) was very common on some corn plants in southern ILLINOIS in early June.

Several species of THRIPS were abundant on young corn in MARYLAND; streaking and silvering of foliage was noted in all sections during May and June.

TWO-SPOTTED SPIDER MITE (Tetranychus urticae) severely damaged corn and other crops in eastern WASHINGTON and it was more damaging than usual in western areas because of the hot, dry weather. This spider mite heavily infested sweet corn leaves in the Willamette Valley of OREGON during late September. SPIDER MITES (Tetranychus spp. and/or Oligonychus spp.) were heavy on corn in Churchill County, NEVADA. Infestations were light to medium in Pershing County and generally light in remaining counties. Spider mites were the most numerous pests for the sixth consecutive year in Nevada. Moderate to heavy infestations of Tetranychus spp. were found in sorghum fields of Yuma, Maricopa, Pinal and Graham Counties, ARIZONA; controls were necessary in many fields. Spider mites were not a problem on corn in COLORADO. Tetranychus sp., probably urticae, and BANKS GRASS MITE (Oligonychus pratensis) caused some damage to late corn in southwest KANSAS during mid-August; controls were required. Tetranychus spp. were minor pests of corn in OHIO. Light to moderate populations of Tetranychus spp. were noted on sweet corn throughout NEW JERSEY. Tetranychus spp. severely damaged field corn breeding stock in FLORIDA; some border row plants were killed.

LAWN, PASTURE AND RANGELAND INSECTS

FALL ARMYWORM (Spodoptera frugiperda) was a major pest of lawns in ALABAMA. Outbreaks of ARMYWORM (Pseudaletia unipuncta) occurred on the Eastern Shore of MARYLAND in May where damage to pastures was extensive. This noctuid occasionally damaged pasture grasses in MISSOURI in early June. Larvae of BLACK CUTWORM (Agrotis ipsilon) were found crawling on surface of bentgrass greens in Pawnee County, KANSAS; no damage. A. ipsilon heavily infested golf greens in Clark County, NEVADA, in May. Late fall damage caused by GLASSY CUTWORM (Crymodes devastator) occurred in 3 fields of bluegrass in Linn County, OREGON.

SOD WEBWORMS (Crambus spp.) were common in lawns in RHODE ISLAND but fewer adults were seen in flight than in 1964. Populations were moderate over much of NEW JERSEY except in southern counties where heavy injury occurred on home lawns. These grass moths caused only minor incidents of lawn damage in OHIO. While common in INDIANA, they were not so destructive to lawns as in other recent years;

some controls were necessary in scattered areas. Larvae were troublesome in ILLINOIS lawns in some areas but damage was not nearly so severe as in 1963 and 1964. A large species destroyed large areas of buffalo grass in fairways of a golf course in Pawnee County, KANSAS. Silk tubes covered top of ground where damage was most severe. Larvae were found in tunnels 8-10 inches below soil surface.

RANGE CATERPILLAR (Hemileuca oliviae) caused extensive damage during the fall months in the Farley-Abbott area of Colfax County, NEW MEXICO; each year the area generally infested by this saturniid increases in that county. WESTERN TUSSOCK MOTH (Hemerocampa vetusta) caused heavy damage to bitterbrush in southern Washoe County, NEVADA; however, the infestation was much less than that of 1964. In CALIFORNIA, a PHYCITID MOTH (Eumysia mysiella) infested sagebrush. A PYRAUSTID MOTH (Marasmia trapezalis) caused heavy damage in spots to pasture grasses, particularly Pangolagrass (Digitaria decumbens), in FLORIDA at Belle Glade in late summer. A SKIPPER (probably Hylephia sp.) heavily damaged Coastal and common Bermuda grasses in Henderson, Leon, Rains, Van Zandt and Travis Counties, TEXAS.

HAIRY CHINCH BUG (Blissus hirtus) adults were heavy on a golf course in Westerly, RHODE ISLAND, in early May. CHINCH BUG (B. leucopterus) caused extensive damage to home lawns in central and northern counties of NEW JERSEY; much of the damage during summer months was overlooked by homeowners and attributed to drought injury. Populations reached high proportions during late August and early September but satisfactory control measures could not be applied in many areas due to restrictions placed on use of water. B. leucopterus was a major pest of lawns in ALABAMA. B. insularis continued to be a problem on St. Augustine grass lawns in FLORIDA; commercial spraymen were commonly called upon to provide controls. B. insularis severely damaged St. Augustine grass pastures at Belle Glade, Palm Beach County. B. leucopterus damaged lawns over much of eastern and gulf coast areas of TEXAS.

A SPITTLEBUG (Prosapia bicincta) caused economic damage to recently sprigged pastures of St. Augustine grass at Belle Glade, FLORIDA. GROUND PEARLS caused considerable damage to lawns in ALABAMA. RHODES-GRASS SCALE (Antonina graminis) damaged zoysia and Bermuda grass lawns in most areas of southern ARIZONA during the summer months. A MEALYBUG (Phenacoccus graminosus) infested Avena fatua (wild oat) and Bromus rigidus (ripgut grass) in Yuba County, CALIFORNIA, and Stipa sp. (needlegrass) in Butte County.

A MAY BEETLE (Phyllophaga tristis) was recorded for the first time in WASHINGTON; it was taken at least one thousand miles west of its previous known distribution. This scarab was heavy in Clark County in late May. TEN-LINED JUNE BEETLE (Polyphylla decemlineata) caused extreme damage to 600 acres of irrigated pastures in Grant County, Washington. Larvae of a SCARAB (Cyclocephla sp.) caused medium damage to turf at a golf course in Clark County, NEVADA, in September. In KANSAS, a BILLBUG (Sphenophorus venatus vestitus) was found injuring zoysia turf in the Greater Kansas City area; apparently this weevil successfully overwintered there. Occasional individuals of ORIENTAL BEETLE (Anomala orientalis) are encountered in RHODE ISLAND, but were not an economic problem in 1965 although some grub damage to lawns occurred.

CHLOROPID FLIES were found in damaging numbers on bentgrass golf greens in northeastern KANSAS; feeding caused small yellowing spots and later dead spots to appear in greens. A DESERT TERMITE (Amitermes sp.) was noted on range grasses from a wide area of TEXAS.

BANKS GRASS MITE (Oligonychus pratensis) was light with little damage in northwest NEBRASKA. Infestations and damage were heavy on timothy in Lyon County NEVADA, in late May and June with controls required. This is third consecutive year of heavy populations there. This pest was scattered with moderate damage to Bermuda grass seed fields in Yuma County areas, ARIZONA; some controls necessary. BERMUDAGRASS MITE (Aceria neocynodonis) seriously damaged many Bermuda grass lawns in Yuma, Pinal and Pima Counties. Unless properly controlled, this eriophyid mite can become serious. A SNAIL (Vallonia pulchella) caused some damage to lawns in Multnomah and Lane Counties OREGON during September.

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